ISSN (print) 0093-4666 © 2013. Mycotaxon, Ltd. ISSN (online) 2154-8889

MYCOTAXON

http://dx.doi.org/10.5248/126.77

Volume 126, pp. 77–81 *October–December 2013*

Embryonispora, a new genus of hyphomycetes from China

Kai-ning Zhao[1], Guo-hua Yin[2], Guo-zhu Zhao[1]* & Ai-xin Cao[3]

[1]*College of Biological Sciences and Biotechnology, Beijing Forestry University, Beijing 100083 PR China*

[2]*College of Agriculture & Life Sciences, The University of Arizona, Tucson, AZ 85721 USA*

[3]*State Key Laboratory of Urban & Regional Ecology, Research Center for Eco-environmental Sciences, Chinese Academy of Sciences, Beijing 100085 PR China*

* Correspondence to: *zhaogz@im.ac.cn*

Abstract — *Embryonispora bambusicola* gen. & sp. nov., found on dead culms of bamboo and dead branches of an unidentified tree in China, is described and illustrated. The genus is characterized by sporodochial conidiomata and muriform, reniform or flattened, dorsiventrally curved, pale brown to brown conidia. The new taxon is compared with morphologically close related genera and species.

Key words — anamorphic fungi, dictyosporous fungi, taxonomy

Introduction

In a study of dictyosporous hyphomycetes from China, several fungal specimens were collected between 2002 and 2003. A fungus with sporodochial pulvinate or effuse conidiomata and flattened dorsiventrally curved muriform embryoniform conidia was found among them. It cannot be assigned to any previously described genus and therefore is described here as new.

Materials & methods

Decayed waste wood was collected in the field of Zhejiang and Hainan Province, China. Samples were placed separately into plastic or paper bags and stored in a refrigerator at 4°C before microscopic study. They were incubated to induce sporulation in moist containers (plastic bags or boxes) at room temperature. Humidity was maintained by adding moistened paper towels. The incubated samples were examined microscopically for the presence of microfungi after 4–5 days and up to one month. Sporulated colonies were removed from the surface of the wood with a needle and transferred to a drop of lactophenol on a microscope slide. Extensive attempts to culture fungi on artificial media (water agar, 2% malt extract agar) failed. Digital photomicrographs were taken using an Olympus BX-51 microscope. Herbarium specimens and slides were deposited in HSAUP (Herbarium of Shandong Agricultural University: Plant Pathology) and HMAS (Herbarium of Mycology, Chinese Academy of Sciences).

Taxonomy

Embryonispora G.Z. Zhao, **gen. nov.**

MycoBank MB 802690

Differs from other sporodochial genera by its reniform and dorsiventrally curved conidia.

Type species: *Embryonispora bambusicola* G.Z. Zhao

Etymology: *Embryonispora*, referring to the conidia, which are shaped like a human embryo.

Conidiomata on natural substrate sporodochial, superficial, olivaceous, brown to dark brown. Mycelium partly superficial and partly immersed. Conidiophores undifferentiated, reduced to conidiogenous cells. Conidiogenous cells monoblastic, integrated, terminal, determinate. Conidial secession schizolytic. Conidia solitary, acrogenous, embryoniform or reniform, curved dorsiventrally, flattened from side to side, sometimes variable in shape, muriform, with longitudinal, transverse and oblique septa, with 1–2 layers of cells, holoblastic, olivaceous, pale brown to brown.

Embryonispora bambusicola G.Z. Zhao, **sp. nov.** Figs 1, 2

MycoBank MB 802691

Differs from other sporodochial species by its reniform, dorsiventrally curved, muriform conidia usually composed of 1–2 layers of marginal cells and some irregular protruding core cells.

Type: China. Zhejiang Province, Hangzhou Botanical Garden, on dead bamboo culms, 12 August 2002, coll. G.Z. Zhao ZGZII$_{02}$172 (**Holotype**, HSAUP0972).

Etymology: *bambusicola*, referring to the host on which the taxon was first found.

Conidiomata on natural substrate sporodochial, scattered to confluent, pulvinate, brown to dark brown. Mycelium superficial and immersed, composed of septate, pale brown to brown, smooth-walled, branched hyphae. Conidiophores undifferentiated. Conidiogenous cells monoblastic, integrated, pale brown, determinate, cylindrical. Conidial secession schizolytic. Conidia solitary, curved dorsiventrally, embryoniform or cerebriform, muriform, with longitudinal, transverse and oblique septa, often constricted at the septa, usually composed of 1–2 layers of marginal cells and some irregular protruding core cells, holoblastic, olivaceous, pale brown to brown, 16–22 × 12–16 µm, 9–11 µm thick. Basal cell protruding, obconical to cylindrical, subhyaline to pale brown, truncate, 1.5–2.5 µm wide.

Additional specimen examined: **CHINA. Hainan Province**, Wuzhishan, on dead branches of an unidentified tree, 14 December 2003, coll. G.Z. Zhao ZGZII$_{03}$106-2 (HMAS 90279).

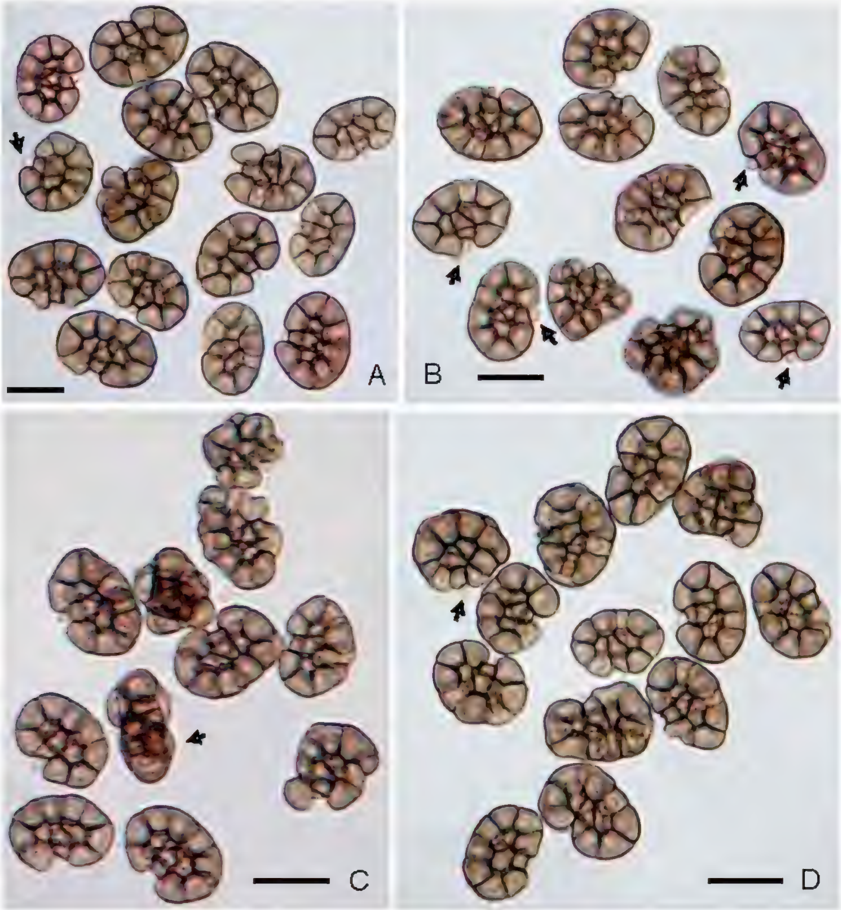

Fig. 1. *Embryonispora bambusicola* (holotype HSAUP0972).
A–D. Conidia; arrows show pale brown basal cells and conidia in side view. Bars = 10 µm

Discussion

Several genera with sporodochial conidiomata, less differentiated conidiophores, and muriform conidia are morphologically similar to *Embryonispora*. They include *Canalisporium* Nawawi & Kuthub., *Dictyosporium* Corda, *Turturconchata* J.L. Chen et al. (= *Venustusporium* R.F. Castañeda & Iturr., now corrected to "*Venustisporium*" in accordance with Art. 60.8 of the International Code of Nomenclature, McNeill & al. 2012), *Oncopodiella* G. Arnaud ex Rifai, *Petrakia* Syd. & P. Syd., *Oncopodium* Sacc., and *Hermatomyces* Speg. (Ellis 1971, 1976; Nawawi & Kuthubutheen 1989; Chen at al. 1999; Castañeda & Iturriaga 1999; Chung & Tzean 2000). *Canalisporium* and

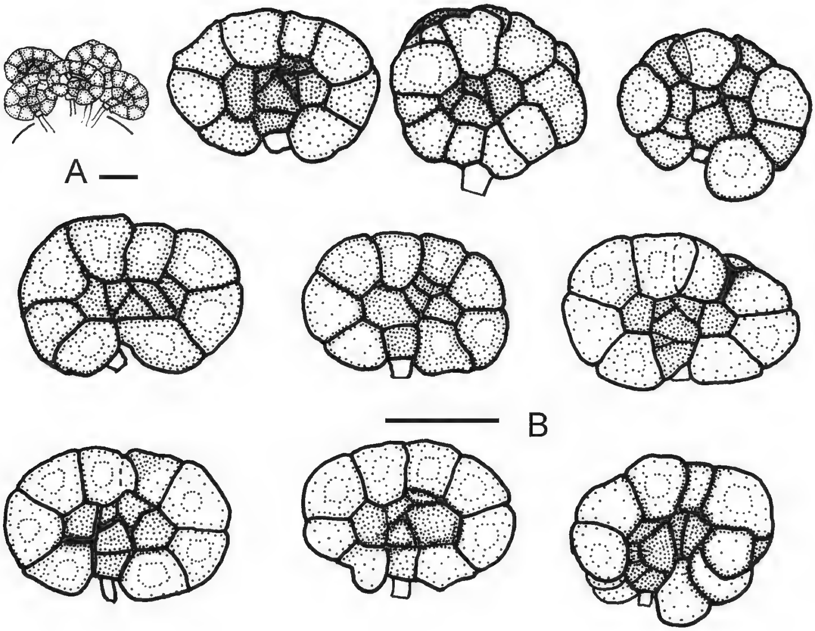

FIG. 2. *Embryonispora bambusicola* (holotype HSAUP0972).
A. Sporodochium with conidia; B. Mature conidia with pale brown basal cells. Bars = 10 µm

Dictyosporium can be separated from *Embryonispora* by having cheiroid, fan-shaped, regularly muriform, flattened conidia, which are usually composed of columns or rows of cells. The conidia of *Turturconchata* are borne horizontally flattened, muriform, margin irregular, somewhat crenate, eccentric protuberate pedicel, while those of *E. bambusicola* are vertically dorsiventrally curved and muriform. *Oncopodiella* and *Petrakia* differ from *Embryonispora* by producing muriform conidia with hyaline horn-like protruding cells. *Oncopodium* is distinct from *Embryonispora* in having conidia that commonly contain swollen basal cells. *Hermatomyces* differs from *Embryonispora* in the presence of lenticular conidia.

Key to *Embryonispora* and morphologically similar genera

1. Conidia usually flattened 2
1. Conidia not flattened, with protruding hyaline horn-like cells 3
2. Conidia dorsiventrally curved. 4
2. Conidia shaped differently 6

3. Horn-like cells >8 µm .... ***Petrakia***
3. Horn-like cells shorter, <8 µm .... ***Oncopodiella***

4. Conidia subglobose or hemispherical, clathrate or muriform .... ***Oncopodium***
4. Conidia shaped differently.. 5

5. Conidia embryoniform or cerebriform, muriform .... ***Embryonispora***
5. Conidia horizontally, flattened, muriform, margin irregular, somewhat crenate, eccentric protuberate pedicel .... ***Turturconchata***

6. Conidia lenticular, muriform, with pale peripheral cells surrounding the central cells .... ***Hermatomyces***
6. Conidia shaped differently.. 7

7. Conidia usually cheiroid, composed of columns or rows of cells .... ***Dictyosporium***
7. Conidia broadly ellipsoidal, with cell lumen connected by narrow canals .... ***Canalisporium***

Acknowledgments

We are deeply grateful to Drs. G. Delgado (EMLab P&K, USA) and M. Zhang (Henan Agricultural University, China) for kindly serving as pre-submission reviewers and their useful suggestions. This project was supported by the National Natural Science Foundation of China (Project No. J1103516 & 31093440) and the Fundamental Research Funds for the Central Universities (No.TD2012-03).

Literature cited

Castañeda RF, Iturriaga T. 1999. *Venustusporium*, a new genus of hyphomycetes from Venezuela. Mycotaxon 72: 455–459.

Chen JL, Huang TL, Tzean SS. 1999. *Turturconchata*, a new genus of hyphomycetes from Taiwan. Mycological Research 103: 830–832. http://dx.doi.org/10.1017/S0953756298008016

Chung CH, Tzean SS. 2000. Notes on the genera *Turturconchata* and *Venustusporium* (mitosporic fungi). Mycotaxon 75: 311–313.

Ellis MB. 1971. Dematiaceous hyphomycetes. Commonwealth Mycological Institute, Kew, Surrey.

Ellis MB. 1976. More dematiaceous hyphomycetes. Commonwealth Mycological Institute, Kew, Surrey.

McNeil J, Barrie FR, Buck WR, Demoulin V, Greuter W, Hawksworth DL, Herendeen PS, Knapp S, Marhold K, Prado J, Prud'homme Van Reine WF, Smith GF, Wiersema JH. 2012. International code of nomenclature for algae, fungi, and plants (Melbourne Code). Regnum Vegetabile 154. Koeltz Scientific Books. [Online: www.iapt-taxon.org/nomen/main.php]

Nawawi A, Kuthubutheen AJ. 1989. *Canalisporium*, a new genus of lignicolous hyphomycetes from Malaysia. Mycotaxon 34: 475–487.